

In the Claims

1. **(currently amended)** A method of imaging, measuring and displaying a 3-dimensional dose distribution of an energy field in a translucent 3-dimensional object comprising:

(a) forming a 3-dimensional object from a dispersion of a crystalline, radiochromic polyacetylene monomer having a conjugated structure uniformly distributed in a rigid or high density semi-solid matrix,

~~(a) (b) applying an energy field to said 3-dimensional object such that the radiochromic polyacetylene monomer undergoes polymerization upon receipt of said energy thereby the optical properties of the object change in proportion to the dose of absorbed energy the object such that the optical properties are changed upon receipt of the energy;~~

~~(b) (c) optically scanning the object at various positions and angles to provide a series of 2-dimensional representations of the object~~ heating said 3-dimensional object to a temperature sufficient to solubilize the crystalline radiochromic polyacetylene monomer in said rigid or high density semi-solid matrix, thereby rendering said object transparent to light;

~~(d) optically scanning the object at various positions and angles to provide a series of 2-dimensional representations of the object;~~

~~(e) (e) detecting the measuring light projection transmission through the object data indicative of optical changes in the object;~~

~~(d) (f) calibrating the optical change in the object transmitted through the object by x-rays corresponding to the dose of the absorbed energy corresponding to each position scan;~~

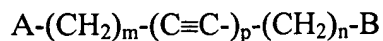
~~(e) (g) mapping the dose of the energy transmitted through the absorbed in the object, and~~

~~(e) —visually recording the summation of said 2 dimensional representations on an image display receiver using said energy transmitted through the object comprising a radiation activated metal salt of a crystalline, thermochromic polyacetylene having a conjugated structure uniformly distributed in a rigid or high density semi solid matrix by a color alteration due to polymerization of the activated polyacetylene to provide a permanent, 3-dimensional image of the object in high spatial resolution.~~

(h) reconstructing said 2-dimensional representations to provide a 3-dimensional image of the object in high optical resolution.

2. – 7. (previously cancelled)

8. **(original)** The method of claim 1 wherein said crystalline polyacetylene is a C₂ to C₁₀ radiochromic monomer having the formula:



wherein m and n each independently have a value of from 0 to 30; p has a value of 2 to 4; A and B each independently are R, OR₁, OH, COOR₂, CONR₃R₄ or (CH₂)_r-O-CO-NR₅R₆ or a metal salt of the acid or ester; and where R, R₁, R₂, R₃, R₄, R₅ and R₆ are each independently hydrogen or C₁ to C₁₂ alkyl or aryl and r has a value of from 1 to 4.

9. **(original)** The method of claim 1 wherein the metal salt of the crystalline polyacetylene is a lithium salt.